

module comprising an image sensor with pixels for conducting photoelectric conversion, and an analogue-to-digital converter for conversion of an analogue signal generated by said pixels into digital image information , the camera module further comprising a serial connection circuit for transferring digital image information to the electronic device and for receiving control information relating to the quantity and rate of the transfer from the electronic device via an internal serial connection bus of the electronic device.

64. (Currently Amended) A mobile station, comprising a camera module constructed as a non-removable, integral part of the mobile station, the camera module comprising an image sensor with pixels for conducting photoelectric conversion, an analogue-to-digital converter for converting an analogue signal generated by the image sensor into digital image information and a serial connection circuit for transferring digital image information formed by the camera module to the mobile station, the mobile station comprising an internal serial connection bus for transferring digital image information from the camera module to the mobile station and for transferring control information relating to the quantity and rate of the transfer from the mobile station to the camera module.

IV. REMARKS

Status of the Claims

Claims 1, 7, 13 and 62-64 are amended. Claims 1, 3-7, 9-11, 13,16,19, 21-37 and 44,45,47, and 49-64 are presented for further consideration.

Summary of the Office Action

Claims 1,7 and 13 stand rejected under 35USC103(a) on the basis of the cited reference Sanemitsu, U.S. Patent No. 5,708,853, in view of the teaching of Koppa, U.S. Patent No. 6,088,746 and further in view of the teaching of Fukumitsu, et al, U.S. Patent No. 6,141,052.

Claims 3-5,9-11,16,21-29,31-37, and 44,45,47, and 49-61 stand rejected under 35USC103(a) on the basis of the combined teachings of the references Sanemitsu and Koppa, in view of the reference Fukumitsu and further in view of the reference Endsley, U.S. Patent No. 6,005,613.

Claim 6 stands rejected under 35USC103(a) on the basis of the reference Sanemitsu in view of the teachings of Koppa in view of Fukumitsu, in view of Endsley and further in view of the disclosure of Miyake, U.S. Patent No. 6,400,413.

Claims 19 and 30 stand rejected under 35USC103(a) based on the reference Sanemitsu in view of the teachings of Koppa and Fukumitsu and further in view of the disclosure of Hsieh, et al, U.S. Patent No. 5,969,750.

Claims 62-64 stand rejected under 35USC103(a) based on the reference Harris, et al, U.S. Patent No. 6,009,336 in view of the teachings of Aruga, et al, U.S. Patent No. 6,429,896.

The Examiner is respectfully requested to reconsider his rejection in view of the above amendments and the following remarks.

The claims of this application were previously amended to

clarify that the cameral module is integral with the electronic device and thereby avoid the confusion with the use of the word "integrated". These words nevertheless still seem to be misinterpreted. According to the "Merriam-Webster Dictionary" the word integral is an adjective that means "essential to completeness; formed as a whole". None of the systems of the cited references involve devices in which the camera module is constructed integrally with an electronic device. The Examiner has chosen the word integrated to describe separate components that are merely connected and can be readily detached without dismantling the electronic device.

Applicant has further amended the claims in this office action to make it clear that the control exerted by the electronic device is more than turning on the camera function but involves the control of the quantity and rate of the image information transferred.

Discussion of the Cited References

The Examiner has repeated the rejection of pending independent claims 1, 7, and 13 primarily on the basis of the combined teachings of the cited references Sanemitsu and Koppa, but has added the further consideration of the reference Fukumitsu.

Sanemitsu's patent relates to an IC card including an image input device and an acoustic input device (see abstract) which can be inserted into a corresponding IC card slot (column 1, lines 52 to 55) of a computer or personal assistant device in order to provide that device with image and sound transmission capabilities. In at least some embodiments, Sanemitsu's IC card can be inserted into a notebook-sized computer in such a way that it is completely enclosed by the structure of the computer

(see Figures 3 and 4 together with their corresponding descriptions from column 3, line 60 to column 4, line 19). Nevertheless it is not integral as intended by the claims of this application.

Köppä's patent, on the other hand, relates in general to expansion cards for use with electronic devices such as mobile telephones or computers. As explained in column 1, in lines 11-31, such expansion cards are connected to the host device with a connector and are typically implemented according to a standard (e.g. the PCMCIA standard), which defines the function of each pin of the connector. Köppä's patent presents a mechanism enabling an operating mode of an IC card to be set by supplying a signal via a pin of a standard connector that is usually used for another purpose according to the standard (see, for example, column 3, lines 43 to 47, column 4 line 66 to column 5, line 19 and column 5, Table 1). As part of the disclosure of one of Köppä's embodiments, it is mentioned that data is transferred in serial form between the expansion card and the electronic device to which it is connected (column 7, lines 25 to 34).

In his rejections of the independent claims 1, 7, and 13, the Examiner states that it would have been obvious to a person of ordinary skill in the art to combine the teachings of Sanemitsu with those of Köppä in order to arrive at the invention claimed in the present application. However, the Applicant respectfully disagrees with this view since both Sanemitsu and Köppä relate to the structure (Sanemitsu) and data transfer characteristics (Köppä) of an IC/expansion card that is connected to a host device.

The claims of the present invention, on the other hand, relate to the transmission of image information between a camera module

and an electronic device, where the camera module is an integral part of the electronic device. Neither Sanemitsu's IC card nor Köppä's expansion card are constructed as an integral part of their respective host devices.

The devices of Sanemitsu and Koppa are peripheral/additional devices that can be connected or disconnected and used in connection with the host device. They are separate devices, not integral components of the host. Therefore even a combination of Köppä with Sanemitsu, as suggested by the Examiner, cannot possibly render the present invention obvious. At least for this reason, the Applicant submits that the claims, as amended, are patentably distinct from the teachings of Sanemitsu and Köppä when considered either alone or in combination. This position is not changed by the addition of the combined teachings of Sanemitsu and Koppa with the disclosure of Fukumitsu.

The Examiner has characterized the reference Sanemitsu as follows:

"Although Sanemitsu is silent with respect to: (a) constructing the camera module as an integral part of the electronic device, (b) using the electronic device for controlling the transfer of the digital image information, and (c) transferring the digital image information from the camera module to the electronic device via an internal serial connection bus of the electronic device"

This is a reasonable statement of the issues remaining in this application. The Examiner asserts that the disclosure of the reference Fukumitsu describes items (a) and (b) in an analogous art.

A careful review of the Fukumitsu reference reveals no mention of controlling the transfer of image data from the electronic

device. In the excerpt referenced by the Examiner, the only mention of image transfer appears to be as follows:

"By operating the keyboard 12 or the track pad 13, a desired image is picked up by the CCD 21, and it is input as image data into the personal computer 10. If necessary, the image data may be stored in a storage medium such as a hard disc or the like which is installed in the personal computer 10, or printed by a printer (not shown)."

Applicant submits that there is nothing added by the citation of this reference that remedies the deficiencies in the primary reference Sanemitsu as stated by the examiner.

With respect to the nature of the construction of the camera of Sanemitsu, it is described in the summary of the invention as follows:

"Further, the electronic camera which is detachably mounted on the mount recess portion secured to the portable personal computer comprises a lens, an image pickup element, a cubic housing in which the lens and the image pickup element are accommodated and which is brought into contact with the curved-face support portion provided to the mount recess portion of the personal computer so as to be rotatable, and a connector for outputting image data obtained from the image pickup element through a cable."

The Examiner's attention is also directed to column 5, lines 58-59 and column 6, lines 31-36. The teaching of Fukumitsu is to make the camera detachable not integral according to the claims of this invention.

Therefore, contrary to the Examiner's assertion the reference Fukumitsu does teach anything meaningful with respect to either feature (a) or feature (b) as designated by the Examiner.

The Examiner agrees that the reference Sanemitsu is silent, with respect to the feature of this application relating to the control of the image data transfer by the electronic device, according to the claims of this invention.

For the reasons stated in a prior response, Applicant submits that the reference Köppä teaches nothing which relates to image capturing, image storage, image transfer, and controlling the image capturing and/or transfer. Also the combination of Sanemitsu and Köppä does not teach anything which could make the present invention obvious to an expert in the field, because neither of these publications disclose details of an electronic device, having an integrally constructed camera module, wherein the image transfer process is controlled by the electronic device.

This is true of the other references cited by the Examiner in what appears to be an infinite list of references that has resulted from the Examiner's reluctance to view the claims as whole. Applicant submits that the Examiner has sought the individual elements of the claims in this application using the disclosure of the subject application as a template.

Based on the above analysis, there are significant differences between the prior art publications and the present invention namely, that, in the prior art publications, only the capturing (and parameters relating to it) are controlled by the electronic device, for example the cited reference Endsley (US 6,005,613). According to the present invention, the quantity and rate of transfer of the images is controlled by the electronic device. Such controlling of the image transfer is not disclosed in the prior art publications.

In the prior art publications controlling of the host device relates to setting capturing parameters or functions /modes, but the actual transfer parameters (separately from the storing or mode settings) are not adjustable by the electronic device, i.e. the host computer.

Conventionally camera modules produce image data in a predetermined form at a rate determined by the camera module itself. Information produced by camera modules of prior art cannot be easily affected, whereby it may be necessary to conduct unnecessary functions in the device receiving the image signal, particularly when the quantity of image information entering the receiving device exceeds the quantity that can be utilized in the receiving device. This transferring of unutilized image information consumes power to an unnecessary degree. Such unnecessary power consumption and any unnecessary functions by the receiving device, are avoided by controlling the transfer of the images by the host device, according to the present invention.

Besides the power consumption, also the size of the electronic device can be made smaller when using the camera module of the present invention. Further, the data transfer bus between the camera module and the electronic device can be made simpler and the connection means for connecting the camera module can be made simpler in the electronic device (paragraph [0021]).

Furthermore, the quantity of image information to be transferred can be adjusted, whereby, e.g., in viewfinder mode, it is possible to display images with less image information at a sufficient speed so that disturbing jerky movement is not shown in the image to be displayed on a display device. When taking

the final picture, the quantity of image information is raised to a desired level.

Some camera modules provide the option of adjusting how often new image is transferred from the camera module. However, the quantity of information in each image is not changed. If the receiving device cannot process all images at the set updating rate but controls the camera module to transfer images at a slower rate, the updating rate may sink to such a low level that it can be detected in the image as discontinuous movement. Thus, the feature of adapting receiving electronic device to control the transfer of the image data has the further advantages of being able to synchronize transfer and updating rates, and thus enhancing the current presentation of the image data.

The feature of this invention relative to the control of the transfer of data is, therefore, significant and represents an advance in the art that is substantial. None of the references cited disclose this feature.

The Examiner has rejected claims 62-64 on the basis of the disclosures of the newly cited references Harris and Aruga. The device of the reference Harris is briefly described in the Abstract according to the following:

"A communication device (104) includes two housings (108, 110), each containing circuitry (114, 115, 116, 117, 118, 122, 123) for operating the communication device (104) in different modes (700, 702, 704, 706, 730, 732). The communication device (104) includes a latch (112) for detachably coupling the two housings (108, 110) and rotating one housing (110/108) with respect to the other (108/110). The communication device (104) switches between the different modes (700, 702, 704, 706, 730, 732) based on the attachment or detachment and the relative position of the housings (108, 110)."

The housing 108 contains the basic components of the host device including power supply, microprocessor, memory and others. The housing 110 contains a display coupled to a camera and communicates with the housing 108 via IR modems 172 and 160.

The Examiner characterizes the camera module as follows:

"Harris, et al disclose.....the camera module(user interface 123) being non-removable, integrated component of the electronic device (via swivel 190)....."

This statement is not supported by the disclosure of Harris. the user interface comprises the display 184. The display is coupled to the camera 188 within housing 110 and the housing 110 is clearly described as detachable via latch 112 from the electronic device in housing 108. The system of Harris, et al is similar to that of the cited reference Sanemitsu. According to the Examiner's definitions, the camera of housing 110 may be integrated with the electronic device of housing 108, but is not integral as required by the claims as amended.

This deficiency is not remedied by combination with the disclosure of Aruga, et al which is cited for showing a serial connection, similar to that of the reference Koppa.

The Examiner has dismissed a portion of the above argument with the use of the words "integrated" and "integral", but has ignored the key issue, namely, that the camera module of Harris is detachable. This feature renders the camera module, not an integral portion of the host device, no matter how it may be characterized when attached. The camera module of Harris is not

"formed as a whole" according to the definition of the word "integral" and the claims of this application.

The Issue of obviousness

It is well settled that in order to establish a prima facie case for obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, without reference to the disclosure of this application.

Applicant submits that the above described deficiencies of the primary references Sanemitsu and Koppa are not remedied by the proposed combination with the teaching of any of the references Fukumitsu, Endsley, Harris, Aruga, or Hsieh. Similarly the deficiencies of the cited reference Harris are not remedied by combination with Aruga. None of the references cited by the Examiner either alone or in combination disclose a camera module that is constructed as an integral part of a host electronic device and that provides the feature of controlling the transfer of images by the host device.

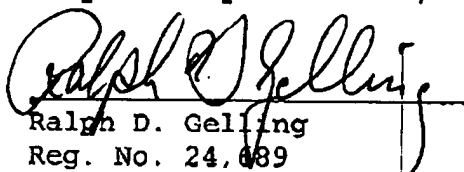
The combined references do not therefore support a prima-facie case of obviousness. The modification of the teachings of Sanemitsu, Koppa, and Endsley, Hsieh, Harris and Aruga in order to obtain the invention, as described in the claims submitted herein, would not have been obvious to one skilled in the art.

The above arguments also apply to the rejections of the dependent claims.

In view of the remarks stated above, Applicant submits that all of the claims under consideration contain patentable subject matter and favorable action by the Examiner is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

The Commissioner is hereby authorized to charge payment for any fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,


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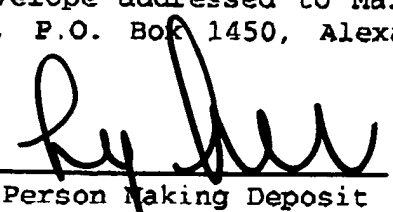
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